IN THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF MISSISSIPPI NORTHERN DIVISION

JERMAINE DOCKERY, et al **PLAINTIFFS**

v. **Civil Action No. 3:13cv326-WHB-JCG**

RICHARD D. MCCARTY[1], et al **DEFENDANTS**

AFFIDAVIT OF EMLEE WOODARD NICHOLSON

STATE OF MISSISSIPPI
COUNTY OF HINDS

PERSONALLY APPEARED BEFORE ME, the undersigned authority in and for the county and state aforesaid, EMLEE WOODARD NICHOLSON, who having been duly sworn stated on her oath as follows:

1. My name is Emlee Woodard Nicholson and I am an adult resident citizen of the state of Mississippi.

2. I am over the age of 21 years of age and competent to testify with regard to the matters stated herein. I have personal knowledge of the facts and information contained in this affidavit.

3. I earned a BBA in Actuarial Science from Georgia State University where I received the award for excellence in my field. I worked as an actuary for two years before earning my Masters and PhD in mathematics from the University of Mississippi where I received the award for excellence in my field.

[1] Pursuant to F.R.C.P. 25(d), Richard D. McCarty, Interim Commissioner, is substituted for Christopher Epps, who resigned as Commissioner on November 5, 2014.

EXHIBIT "40"

4. I am currently an Assistant Professor of Mathematics at Millsaps College in Jackson, Mississippi. Over the past 12 years, I have taught statistics many times both at the University of Mississippi and at Millsaps College. My course includes sampling techniques, research bias and how to avoid it, and statistical study design among many other topics in statistics. My current *Curriculum Vitae* is attached to my affidavit.

INTRODUCTION

5. Dr. Marc F. Stern was at the East Mississippi Correctional Facility for three days. He toured portions of the facility, interviewed selected inmates and reviewed medical records of certain inmates. Based on his observations during these procedures, he made broader conclusions about the overall conditions at the facility and well-being of the inmates.

6. When selecting medical records to review and inmates to interview, Dr. Stern did not employ appropriate sampling techniques that would allow for inferences to be made about any broader population. Furthermore, he shared files with other experts ensuring that their findings would not be independent and that bias would appear in all samples.

7. The methodology employed by Dr. Stern precludes him from making inferences of any sort about the population from which his samples were taken including but not limited to: EMCF as a facility, the population of inmates at EMCF, the population of inmates in isolation at EMCF, the population of inmates receiving mental health services at EMCF, or the population of inmates housed in Units 5 and 6.

8. Based on the samples of medical records, inmate interviews, and cell tours, no valid conclusions can be drawn about any persons other than the specific cases chosen for study.

9. Dr. Stern's conclusions should not be projected from the sample of inmates to the

populations of inmates because he did not use mathematics and statistics to standardize the generalization process. Because Dr. Stern did not use this process, there is no way to confirm the trustworthiness of his generalizations. Scientific techniques have been well established for collecting evidence in support of scientific claims to ensure objectivity. Dr. Stern's conclusions were not built upon scientific evidence and cannot be tested by others. Instead, his conclusions are based on his subjective experience and whims.

10. Dr. Stern used biased sampling when he selected the inmates in the subgroup, he did not take care to ensure that the inmates in the sample were representative of the inmate populations so he can make only biased conclusions about the inmate populations.

11. Additionally, Dr. Stern did not use a scientifically recognized method called statistical inference to analyze the information he obtained from the sample of inmates. Statistical inference is the process of making decisions about a population based on information contained in a sample from that population. Dr. Stern's report contains no evidence that he applied statistical inference. Instead, Dr. Stern's report uses biased samples and anecdotal evidence, but such information is not scientific evidence and should not be used to validate conclusions for the inmate populations.

STATISTICAL INFERENCE AND HYPOTHESIS TESTING OF A PARAMETER OF A POPULATION

12. Statistical inference is the process of using data from a sample of a population to make conclusions (called inferences) about the same population.

13. Statistical inference requires that certain procedures be followed.

14. Statistical inference in the form of hypothesis testing is used when a scientist seeks evidence for suspected truths about a parameter of a population. One must state

hypotheses, collect representative samples, test the information gleaned from those samples, and make appropriate conclusions in context.

15. A parameter is a numerical attribute of the population that describes some aspect of the population. Statistical inference is applicable when the parameter is unknown. A hypothesis test based on sample data should be conducted to test a claim about a parameter of a population.

16. A hypothesis test can be run to seek evidence for a claim about a single parameter of a population or a hypothesis test can be run to compare the same parameter for two or more different populations.

17. A hypothesis test is conducted as follows: First, a researcher must state a measurable claim about a parameter of a population. Second, determine two competing hypotheses for the measurable claim: (1) the null hypothesis and (2) the alternate hypothesis. These hypotheses are the two possibilities. Third, gather data from a representative sample. Fourth, compute the sample statistic that estimates the parameter of the population in the claim. Fifth, determine how probable that statistic would be if the null hypothesis were true. If the observed statistic is determined to be highly unlikely if the null hypothesis were true, that is strong evidence that the null hypothesis is, in fact, not true. If the observed statistic is determined not to be highly unlikely, then the results are not statistically significant and the test was inconclusive.

RANDOM SAMPLING

18. Statistical inference will produce valid inferences only when the sample of the population is representative of the population.

19. Representative sampling is the foundation of inferential statistics. Random sampling is the most reliable way to collect a representative sample because the random sampling process ensures that every member of the population has an equal chance of being in the sample. A formal random sampling technique must be used.

20. The best and most common way to approach randomness is with technology. There are programs (Microsoft Excel, Minitab, etc.) capable of quickly selecting a random sample from a list of the population or from a list of numbers where each member of the population is represented by a number. This can be done in a few seconds. Generally speaking, prison populations are well suited for random sampling because the inmates are all contained in one location and contacting the members of the sample would not be cost prohibitive. The inmates in the population to be sampled can be given a number and the number is then entered into a program which randomly selects the inmates who are to be in the sample.

21. Dr. Stern did not use any formal random sampling technique to select the inmates he interviewed or to select the medical records he reviewed.

EXAMPLE OF STATISTICAL INFERENCE

22. Assume we wanted to know whether inmates on average spend less than 5 hours in the common areas of their cell blocks in a given week. The parameter for the claim is "average amount of time in a given week spent by the inmates in the common areas of their cell block." That parameter is unknown, it is a fixed value that can be expressed in a measurement of time and it represents a characteristic of the inmate population.

23. The null hypothesis would be "the average amount of time spent by the inmates in a given week in the common areas of their cell blocks is greater than or equal to 5 hours." The

alternate hypothesis would be that "the average amount of time spent by the inmates in a given week in the common areas of their cell blocks is less than 5 hours." All inmates in the cell blocks are given a number and a program is used to randomly select 30 inmates from those in the cell blocks. Those 30 inmates are monitored to determine the length of time each of them spends in the common areas in a given week. The average length of time the inmates in the sample spend in the common areas that week is computed from this data. The result for the random sample is an estimate for the average amount of time in a given week all inmates in the population spent in the common areas of their cell block and can be used to test the claim.

BIASED SAMPLING

24. If a sample is collected in any way that causes meaningful differences between the sample and the population, then the sample is biased. A biased sample can produce misleading results so no inferences can be made about a population from a biased sample. Sampling in a way that introduces bias eliminates the possibility of making any meaningful inference about the population from which the sample was drawn.

25. Haphazardly selecting a sample on one's own will likely produce a biased sample. Dr. Stern's report has findings that are based on this type of biased sampling.

26. Allowing individuals to "volunteer" to be in the sample or relying on answers that may not be truthful will likely produce a biased sample. Dr. Stern relied on this type of biased sampling for some of his findings.

27. Selecting individuals to be in the sample because they are examples of a claim's truth is the most egregious form of sampling bias and is unacceptable in a scientific study. Some of Dr. Stern's findings are based on this type of biased sampling.

DR. STERN'S METHODOLOGY AND OPINIONS

28. Dr. Stern studied 23 patient records that he selected from the following nine categories of populations sources:

a) logs of patients sent to the emergency room

b) logs of patients admitted to the community hospital

c) logs of patients housed in the Medical Unit

d) logs of patients who have submitted Sick Call Requests (SCR)

e) the register of patients enrolled in the facility's Chronic Care Clinic (CCC)

f) grievance logs

g) cases referred to me by the mental health subject matter experts based on their own reviews

h) cases referred to me by Plaintiff's attorneys

i) randomly chosen patients with whom I spoke in Unit 7 (the least restrictive housing unit at EMCF) randomly chosen patients with whom I spoke in Unit 5 (the most restrictive housing unit at EMCF). (Stern Report at 4).

29. Dr. Stern does not state how many of the 23 records came from each category.

30. The first five categories (a-e) describe very specific populations. Dr. Stern does not show that the inmates in any of these five population categories were randomly selected. Moreover, inferences could only be made about those inmates who were in the population category from which the sample was taken. Furthermore, the sample drawn from each population category would need to be large enough to draw meaningful conclusions about the population from which it was taken. If Dr. Stern had used a random sample chosen from these

five populations that he studied collectively and separately from the rest followed by statistical inference, he would have produced valid conclusions about those inmates using the health services but his methodology indicates that the samples are biased.

31. The next three population categories (Items f, g, and h) are all inherently biased and should not be included at all. Grievance logs, by definition, contain only individuals who at least believe they have suffered a grievance. Any records from the other two population categories (g and h) have already been reviewed by someone else. This type of selection ensures certain individuals have a 100% chance of being in the sample which is quite far from the 2.5% chance the individual would otherwise have (assuming 1200 individuals in the population and a sample size of 30). A sample containing individuals selected in this manner should not be used to make inferences about any population.

32. For the last population category (Item i), Dr. Stern only selects from the most and least restrictive units at the facility. These patients do not represent the population at large. Furthermore, as Dr. Stern does not mention how he approximated randomness this is more likely not a random sampling at all but rather a convenience, haphazard sampling.

33. Dr. Stern goes on to clarify that in his sample "eight of the 23 cases were chosen because a problem was already suspected." (Stern at 4). Those cases that Dr. Stern deliberately introduced into his sample because they support his claim constitute over one-third of his sample.

34. Suppose you wanted to study a different institution, like a school. You might test whether the prevalence of childhood obesity at the school is too high. For instance, claim that the proportion of obese students at the school is higher than 25%. To gather data that actually

speaks to the prevalence of childhood obesity at the school, you would randomly sample 40 students. You would not identify 14 obese students (around one-third of the sample size) and put them in your sample. To do so would certainly result in a sample that does not represent the population. This sort of sampling deliberately introduces bias and can only lead to biased conclusions.

35. The chance of all 8 of the people that Dr. Stern explains were hand selected to be in his sample actually ending up in a random and therefore representative sample of this size of all 1200 inmates at EMCF is smaller than 1 in 200 trillion.

36. Dr. Stern makes many general claims about larger populations based on his review of the biased sample of patient records. For instance, he claims "the health care system at EMCF…puts the entire inmate population at EMCF at constant substantial risk of serious injury." (Stern at 1). Dr. Stern's conclusions about the health care experiences of those individuals in his sample are not generalizable to "the entire inmate population at EMCF."

37. Dr. Stern also claims "at EMCF, critical orders for care are systematically delayed for significant periods, or simply ignored altogether." (Stern at 11). There was no sampling at all of critical orders for care at EMCF. This conclusion is not based on reliable statistical evidence.

38. To support his claim that inmates lack access to urgent care, Dr. Stern tested call buttons from a sampling of 6 cells in Unit 3, and 3 cells in Unit 5. It appears from Dr. Stern's report that, 6 of the 9 buttons alarmed the switchboard properly (although one of these would not shut off). (Stern at 6). Dr. Stern does not state how these cells were selected or why these tests were only done in Units 3 and 5. But he does state that some prisoners mentioned that their

buttons did not work. If his sample was taken from the cells where a problem was already suspected, it is biased. Additionally, the sample is too small. One certainly cannot make conclusions about emergency call buttons in the cells at EMCF from a sample of nine cells taken from only two of the seven units. In a representative sample of the population about which conclusions are drawn, each cell at EMCF must have an equal chance of being in the sample. Dr Stern has not shown such random sampling occurred here.

39. The rest of Dr. Stern's evidence that inmates lack access to urgent care comes from inmate interviews. The method of selecting inmates to interview is not described in Dr. Stern's methodologies, thus these were likely a convenience sample relying on volunteerism and are inherently biased. All three prisoners whose responses Dr. Stern includes as illustrative cases of his claim are from the isolation unit but he infers his conclusions apple to "inmates at EMCF". Furthermore, only one of the three, Patient 4, described an actual occurrence. However, based on this limited and biased data, Dr. Stern claims "there is a high risk that inmates at EMCF who have an urgent health need will either not be able to make their need known to staff, or, even if they do make their needs known, will not receive timely-or any-care. As a result, there is a high risk they will suffer harm." (Stern at 6-7). Dr. Stern provides no scientific evidence to support this claim.

40. Dr. Stern also claims that inmates lack access to non-urgent care. He cites that "according to the log of patients who submitted SCRs during just the first three weeks of October 2013, 19 patients were denied access to care for custody-related reasons." He concedes that this is understandable in some cases but calls the "frequency of this occurrence at EMCF unacceptable and dangerous." (Stern at 7). While 19 custody related denials may in fact be

frequent at a facility like EMCF, it is worth noting that there were over 240 entries on the Sick Call Request Log between October 1 and October 21, 2013. Composing a sample of this sort using the most recent three weeks is convenience sampling and not random. This issue could be definitively statistically tested if "unacceptable and dangerous" are defined numerically. For instance, assume Dr. Stern believes that more than six prisoners being denied non-urgent care for security issues per week is unacceptable and dangerous regardless of the number of SCRs altogether. Dr. Stern could test the claim that on average more than six inmates at EMCF per week are denied access to non-urgent care for security reasons. To do this, collect the SCRs from a random sampling of weeks over a given time period, count the number of denials in each and statistically determine whether or not the evidence supports this claim. This was not done.

41. A collection of examples is called anecdotal evidence. Anecdotal evidence is not scientific evidence and should not be used to validate conclusions.

42. Dr. Stern goes on to make generalizations about other populations.

43. About the population of LPNs at EMCF he claims "LPNs practice beyond the scope of their licenses." (Stern at 9). However, Dr. Stern's report does not show that he did any sampling at all of the practice of the LPNs. Instead, he supports his claims about a population with two particular LPNs practicing beyond the scope of their licenses one time each. This evidence is anecdotal.

44. Dr. Stern also claims "RNs practice beyond the scope of their licenses" (Stern at 9) when he only supports this broad claim with a few instances of this happening. There was no sampling here either. This is also a misuse of anecdotal evidence.

45. Dr. Stern cannot draw conclusions about the populations of LPNs or RNs at

EMCF in this way. To make valid claims about the LPNs or RNs at EMCF, the relevant information should be collected and reviewed from a random sampling of nurses followed by statistical inference.

46. When Dr. Stern addresses what he describes as "the failure of nursing staff to administer medications as ordered by a practitioner," he explains that the Medication Administration Record (MAR) is not properly maintained and that administered medication is not being properly documented nor is patient refusal to accept medication. (Stern at 12). He relies on three MAR's but does not show these MAR's were randomly sampled. He claims the MAR for Patient 8 was "chosen at random" (Stern at 13) but he does not describe the population from which it was chosen or take care to restrict his conclusions to that population. Furthermore, this random selection was from the records of one particular patient who was likely not chosen at random. All one could conclude from this evidence is that Patient 8 did not regularly receive his medication in October 2013.

47. Studying the regularity with which medications are administered seems reasonable. To do so, Dr. Stern would need to first determine what an unacceptable amount of irregularity is (considering patient refusal, etc.). Next, Dr. Stern should collect a list of all prisoners receiving any type of medication and draw a random sample from that population. From this random sample, the amount of doses not administered could be determined over a given time period. Then the difference between that value and the previously determined unacceptable amount could be statistically compared and meaningful conclusions drawn about that time period. Dr. Stern did not do this.

48. There were no parameters or scope defined at the beginning of Dr. Stern's study.

Dr. Stern claims in his conclusion that the deficiencies he discovered at EMCF create "equal opportunity dangers: they can affect any inmate at any time without regard to age, race, crime, housing unit, or medical condition."(Stern at 89). Dr. Stern made no effort to sample these subpopulations (based on age group, race, etc.). Therefore, he has no scientific evidence to support this claim. Inference from a sample to a population depends upon the existence of a sample and the sample's representativeness of the population to which the inferences are made. Representative samples were not drawn for Dr. Stern's study and statistical inference was not used.

49. Dr. Stern did not use a formal or scientific procedure at all when making inferences about EMCF and its populations. Instead, he makes these conclusions without the assistance of science. He has used no procedure to support his claims about the populations that can be tested. The mechanisms he used to draw conclusions about the populations at EMCF exist only in his head. His procedure could not be peer reviewed.

50. Dr. Stern employed no reliable principles or methods when making conclusions about the populations. There are reliable principles and methods for supporting the types of conclusions he makes but these are not even mentioned in Dr. Stern's report much less utilized. There is no way to know the potential rate of error but it is reasonable to suspect it is quite high. Dr. Stern took anecdotal evidence and concluded these anecdotes are applicable to the whole population. There are no standards or controls in Dr. Stern's procedure. In fact, he used no formal procedure at all.

51. Dr. Stern's technique is not accepted to any degree in the scientific community. The type of evidence he provides is called anecdotal and is used in the scientific community to mean

the opposite of scientific evidence. There are only two ways to demonstrate sufficient scientific evidence exists to support claims about populations. One is to study the entire population. The other is to take a representative sample and apply statistical inference to make conclusions about the population. There is no other accepted technique. Dr. Stern did not study every individual in the populations about which he made conclusions. Nor did he take a representative sample and use statistical inference. Therefore, the conclusions about the populations are not based on sufficient facts or data. Dr. Stern misused anecdotal evidence to validate conclusions that can only be validated with scientific evidence.

And further affiant sayeth not.

EMLEE W. NICHOLSON, Ph.D.

SWORN TO AND SUBSCRIBED BEFORE ME, this the 15th day of December, 2014.

NOTARY PUBLIC

My Commission Expires:

STATE OF MISSISSIPPI NOTARY PUBLIC ID # 25790 MARY LYNNE AGNEW UNDERWOOD Commission Expires July 31, 2017 RANKIN COUNTY

Emlee W. Nicholson

Curriculum Vitae

email: emlee.nicholson@millsaps.edu

Education

University of Mississippi, University, MS

Doctor of Philosophy in Mathematics, May 2007

University of Mississippi, University, MS

Master of Science in Mathematics, May 2004

Georgia State University, Atlanta, GA

Bachelor of Business Administration in Actuarial Science, May 2000

Cum Laude

Mississippi State University, Starkville, MS

June 1995 - May 1998

Professional Experience

Assistant Professor, Millsaps College, Department of Mathematics, August 2010-present

Assistant Professor, Winthrop University, Department of Mathematics, August 2007 - July 2009

NSF North Mississippi Grades K-8 Fellow and Administrator, University of Mississippi, June 2006 - May 2007

NSF NMGK-8 Fellow and Elementary Team Leader, University of Mississippi,

June 2005-June 2006

NSF NMGK-8 Fellow, University of Mississippi, June 2004-June 2006

Graduate Instructor, University of Mississippi, June 2003- May 2006

Graduate Teaching Assistant, University of Mississippi, August 2002-May 2003

Actuarial Associate, Acuff & Associates, Nashville, TN, July 2001-July 2002

Actuarial Associate, Towers Perrin, Atlanta, GA, June 2000-June 2001

Publications

Nicholson, E.W., & Wei, B. Degree Sum Condition for k-ordered Hamiltonian Connected Graphs. *Graphs and Combinatorics,* 2014, 10.1007/s00373-013-1393-x

Nicholson, E.W., & Wei, B. (2014) Long paths containing k-ordered vertices in graphs. *Ars Combinatoria,* 114, 437-448.

Nicholson, E.W., & Strickland D.M. (2009) Making connections to mathematics beyond high school: An exploration of graph colorings. *The MathMate, 32(3).*

Nicholson, E.W., & Wei, B. (2008). Long cycles containing k-ordered vertices in graphs. *Discrete Mathematics,* 308(9), 1563-1570.

Nicholson, E.W. (2008). Making connections to mathematics beyond high school: An exploration of graph connectivity. *The MathMate, 31(2).*

Presentations

E.W. Nicholson and B. Wei. *Degree conditions for weakly geodesic pancyclic graphs and their exceptions.* MAA/AMS Joint Mathematics Meeting, Baltimore, MD, January, 2014.

E.W. Nicholson and B. Wei. *Degree sum conditions for k-ordered hamiltonian connected graphs.* Invited talk at the American Mathematical Society Southeastern Sectional Meeting, Oxford, MS, March, 2013.

E.W. Nicholson and B. Wei. *Degree sum conditions for k-ordered hamiltonian connected graphs.* Invited talk at the University of Mississippi as one of their series of Combinatorics Seminars, Oxford, MS, April, 2012.

E.W. Nicholson and B. Wei. *Degree sum conditions for k-ordered hamiltonian connected graphs.* Session conducted at the Louisiana/Mississippi Sectional MAA meeting, Oxford, MS, February, 2011.

E.W. Nicholson. *Bringing Higher Mathematics into the High School Classroom: An Introduction to Graph Connectivity.* Session conducted at the Annual Meeting of the South Carolina Council of Teachers of Mathematics, Charleston, SC. October 2008.

B. Wei and E.W. Nicholson. *Long Paths containing k-ordered vertices in Graphs.* Session conducted at the SIAM conference on Discrete Mathematics, Victoria, Canada. June 2006.

E.W. Nicholson and B. Wei. *Long Paths containing k-ordered vertices in Graphs.* Session conducted at the Combinatorics Seminar at The University of Mississippi, University, MS. November 2005.

B. Wei and E.W. Nicholson. *Long Cycles containing k-ordered vertices in Graphs.* Presentation given at the MIGHTY XLI conference at Middle Tennessee State University. Murfreesboro, TN. September 2005.

Awards

W. Charles Sallis Award for distinguished service to Millsaps College, 2014

Graduate Student Achievement Award: M.S. in Mathematics, University of Mississippi, 2004

Eli A. Zubay Award for Excellence in Actuarial Science, Georgia State University, 1999

Courses Taught

Math 1130 - Elementary Functions

Math 1150 - Elementary Statistics

Math 1220 - Calculus I

Math 2230 - Calculus II

Math 2310 - Introduction to Advanced Math

Math 3620 - Number Theory

Math 3650 - Linear Algebra

Math 4800 - Graph Theory

Professional Memberships

Mathematical Association of America

Mathematical Association of America Louisiana/Mississippi Section

LA/MS Sectional Project NEXT Fellowship

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STATE OF MISSISSIPPI
COUNTY OF HINDS

PERSONALLY APPEARED BEFORE ME, the undersigned authority in and for the county and state aforesaid, EMLEE WOODARD NICHOLSON, who having been duly sworn stated on her oath as follows:

1. My name is Emlee Woodard Nicholson and I am an adult resident citizen of the state of Mississippi.

2. I am over the age of 21 years of age and competent to testify with regard to the matters stated herein. I have personal knowledge of the facts and information contained in this affidavit.

3. I earned a BBA in Actuarial Science from Georgia State University where I received the award for excellence in my field. I worked as an actuary for two years before earning my Masters and PhD in mathematics from the University of Mississippi where I received the award for excellence in my field.

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4. I am currently an Assistant Professor of Mathematics at Millsaps College in Jackson, Mississippi. Over the past 12 years, I have taught statistics many times both at the University of Mississippi and at Millsaps College. My course includes sampling techniques, research bias and how to avoid it, and statistical study design among many other topics in statistics. My current *Curriculum Vitae* is attached to my affidavit.

INTRODUCTION

5. Dr. Terry Kupers was at the East Mississippi Correctional Facility for three days. During those three days, Dr. Kupers toured the facility and interviewed selected inmates and he reviewed medical records or the summaries of medical records for certain selected inmates. Based on information from the tour, interviews and medical records, Dr. Kupers makes conclusions about the group of selected inmates or sample. Dr. Kupers then generalizes the conclusions he made for the inmates in the sample and projects those conclusions onto two inmate populations: (1) All inmates in the segregation units at East Mississippi Correctional Facility (EMCF) and (2) all inmates at EMCF who have serious mental health needs. (Kupers at 3). That is to say, Dr. Kupers takes the conclusions he made for the inmates in the sample and applies those same conclusions to all inmates in the segregation units or to all inmates who have serious mental health needs.

6. Dr. Kupers' conclusions should not be projected from the sample of inmates to the two populations of inmates because he did not use mathematics and statistics to standardize the generalization process. Because Dr. Kupers did not use this process, there is no way to confirm the trustworthiness of his generalizations. Scientific techniques have been well established for collecting evidence in support of scientific claims to ensure objectivity. Dr.

Kupers' conclusions were not built upon scientific evidence and cannot be tested by others. Instead, his conclusions are based on his subjective experience and whims.

7. Dr. Kupers used biased sampling when he selected the inmates in the sample, he did not take care to ensure that the inmates in the sample were representative of the two inmate populations so he can make only biased conclusions about the two inmate populations.

8. Additionally, Dr. Kupers did not use a scientifically recognized method called statistical inference to analyze the information he obtained from the inmate sample. Statistical inference is the process of making decisions about a population based on information contained in a sample from that population. Dr. Kupers' report contains no evidence that he applied statistical inference. Instead, Dr. Kupers' methodology uses biased samples and anecdotal evidence, but such information is not scientific evidence and should not be used to validate conclusions for the two inmate populations.

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18. Dr. Kupers did not use any formal random sampling technique to select the inmates he interviewed or to select the medical records he reviewed even though random sampling could easily have been used in a prison population setting.

EXAMPLE OF STATISTICAL INFERENCE

19. Assume we wanted to know whether inmates on average spend less than 5 hours in the common areas of their cell blocks in a given week. The parameter for the claim is "average amount of time in a given week spent by the inmates in the common areas of their cell block." That parameter is unknown, it is a fixed value that can be expressed in a measurement of time and it represents a characteristic of the inmate population.

20. The null hypothesis would be "the average amount of time spent by the inmates in a given week in the common areas of their cell blocks is greater than or equal to 5 hours." The alternate hypothesis would be that "the average amount of time spent by the inmates in a given week in the common areas of their cell blocks is less than 5 hours." All inmates in the cell blocks are given a number and a program is used to randomly select 30 inmates from those in the

cell blocks. Those 30 inmates are monitored to determine the length of time each of them spends in the common areas in a given week. The average length of time the inmates in the sample spend in the common areas that week is computed from this data. The result for the random sample is an estimate for the average amount of time in a given week all inmates in the population spent in the common areas of their cell block and can be used to test the claim.

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22. Haphazardly selecting a sample on one's own will likely produce a biased sample. Dr. Kupers' report has findings that are based on this type of biased sampling.

23. Allowing individuals to "volunteer" to be in the sample or relying on answers that may not be truthful will likely produce a biased sample. Dr. Kupers relied on this type of biased sampling for some of his findings.

24. Selecting individuals to be in the sample because they are examples of a claim's truth is the most egregious form of sampling bias and is unacceptable in a scientific study. Some of Dr. Kupers' findings are based on this type of biased sampling.

DR. KUPERS' METHODOLOGY

25. Dr. Kupers makes claims about two inmate populations based on a subgroup of the total inmate population but does not use hypothesis tests to validate the claims. Dr. Kupers

also avoids expressing his findings in objective precise mathematical terms. Instead, he states that his observations are "frequent" or "likely" or are in the "vast majority." These are estimations based on personal experience and are completely unreliable and unsupported by his evidence.

26. Dr. Kupers claims that "At EMCF, the requirement of obtaining informed consent is frequently ignored" but makes no effort to determine the frequency with which informed consent is ignored. He supports his claim with prisoner testimony including "more than a few prisoners complain about involuntary medications…", a video of a prisoner who was involuntarily medicated and what he describes as "far from adequate" documentation in the Emergency Medical Records. (Kupers at 45-47). He did not use random sampling or statistical inference for these findings.

27. Dr. Kupers includes the following as evidence for the claim that the prisoners were malnourished: "I…noticed that many prisoners appeared malnourished and several prisoners told me they were always hungry…" and "Ms. LaMarre found that significant weight loss, of up to twenty or thirty pounds, was documented in the medical records of a number of prisoners" (Kupers at 20). Some individuals who "appear malnourished" and "a number" of records indicating a weight loss of "up to" 20 or 30 pounds is anecdotal evidence and valid conclusions about the two inmate populations are not possible from this type of evidence. To support a claim that the prisoners are losing weight, randomly sample 30 prisoners. For each prisoner in the sample, record the weight on the form from their original intake screening and weigh each one now. Subtract the current weight from the weight at intake for each prisoner and average the 30 differences. This average, the sample mean of the differences, can be used in a

hypothesis test against the null hypotheses that the prisoners have not lost weight (the mean weight loss for the prisoners is 0.)

28. Dr. Kupers states that "many, perhaps most, of the prisoners housed there…are forced to live in the dark for weeks or months on end." He describes no effort to estimate the actual proportion of prisoners who were in a dark cell at the time of his visit. He makes no effort to determine if the cells he did discover were dark at any other time. His support of this claim is the fact that the cells are secured with solid doors as opposed to bars, "in most cells I visited on Unit 5 and 6D…the light bulb …is broken or entirely missing" and "the small horizontal window on the exterior wall of the cell…does not provide significant light" (Kupers at 16). Dr. Kupers did not determine the proportion of prisoners who are in the dark at any moment much less how long the cells remained dark. According to his methodology statement, Dr. Kupers visited an unrepresentative sample of cells in Units 5 and 6D on one occasion. Furthermore he had no established basis for comparison. The existence of broken light bulbs does not indicate a systemic problem. Dr. Kupers makes no mention of how these cells were selected, how many cells were visited, what portion of the total number of cells that was, or precisely how many is "most." Dr. Kupers also does not revisit the cells later to determine if the bulbs are being replaced or at any other time of day. He only considers what he observed at that moment on that day without regard for other variables. It is not valid to use that evidence supporting a claim about "many, perhaps most" prisoners and "for weeks or months on end."

29. Dr. Kupers claims that "…prisoners in segregation at EMCF are denied telephone contact with loved ones" but seeks no support from reliable evidence like phone records. Instead, he supports the claim with prisoner testimony including "prisoners in segregation

universally told me that they are denied phone calls..." (Kupers at 18). Dr. Kupers reported that some of the prisoners told him they were denied phone calls. This is not scientific evidence. When hard evidence, like phone records, is available, there is no reason to rely on prisoner testimony which could be unreliable. Not to mention the prisoners were never randomly sampled and the group Dr. Kupers spoke with cannot be assumed to represent the population.

30. Dr. Kupers reports that "often the officers do not even take the prisoners to yard for their allotted recreation time, or to showers, for weeks on end" (Kupers at 21). Dr. Kupers offers no evidence to support this claim.

DR. KUPERS' OPINIONS

31. Dr. Kupers' claims, conclusions, and opinions stated in his report are about EMCF as an institution and its populations. However, Dr. Kupers did not conduct a study of EMCF as an institution or of its populations. His report contains none of the components that a study of this nature would entail. Dr. Kupers asks no specific questions, defines no variables and establishes no technique for measuring them, states no hypotheses, collects no representative samples, and conducts no hypothesis tests. Scientific support for claims about populations using sample data requires hypothesis tests. Dr. Kupers did not conduct a single hypothesis test, but made the inferences anyway.

32. Instead, he says that his previous experiences put him in a position to determine that instances he and the other Plaintiffs' experts found were evidence that his claims pertaining to the whole population or institution are true. No one has the sort of prior experience that would allow such subjective findings for a few inmates to be generalized for and projected onto the inmate population. His conclusions are subject to his intuition and personal experience. Dr.

Kupers does not even make measurable claims about the prison conditions, staff or inmates. Instead, he says things like "often", "frequently", or "a number of" (Kupers at 3). But he does not define any of these terms or phrases in a way that anyone else could measure them.

33. Dr. Kupers asks us to rely on his expertise studying prisons. He explains that "in forming my opinions I have relied on my training…, my decades of experience as a clinician…, my experience as an expert in other cases…, my experience as a clinician…, my familiarity with the literature…, my experience as a trainer…, my extensive clinical practice…, and my familiarity with position statements…" (Kupers at 10). None of his experiences equip him to be a substitute for the statistical tests required to accurately determine the validity of claims about populations based on sample data.

34. Dr. Kupers' conclusions are based on personal experience and intuition. These types of conclusions are biased by motivation. Problems with this include "focusing on the evidence we like best: when we look at evidence, we may only seek out the information we like. Because we don't want to let go of our beliefs, we "cherry-pick" the information we take in-seeking and accepting only the evidence that supports what we already think and what we want to think" (Research Methods in Psychology, page 33). "When we think intuitively rather than scientifically, we make mistakes. Because of our cognitive and motivational biases, we tend to notice and actively seek information that confirms our ideas" (Research Methods in Psychology, page 36).

35. Basing conclusions on personal experience is not a scientifically valid method. The results of science should be independent of the researcher and not dependent upon the researcher's previous experiences. The conclusions about EMCF and its populations in Dr.

Kupers' study are based largely on his personal experiences and not science.

36. Dr. Kupers' evidence is a collection of examples. This type of evidence is called anecdotal. Anecdotal evidence is not scientific evidence and should not be used to validate conclusions.

37. Determination of the prevalence of an experience requires statistical evidence.

38. Memorable anecdotal evidence should not be misinterpreted as scientific evidence and is not used to validate scientific conclusions. This is exactly as meaningful as going to EMCF and finding some shining examples of a prison system operating exactly as it should and declaring, based on your experience, that since those individuals are doing so well, the entire population of prisoners must be too.

39. Furthermore, much of Dr. Kupers' evidence is based on prisoner interviews. Using individual's responses as data in a situation where the subject is motivated in any way to be untruthful is a good way to bias the sample. Even assuming the prisoners' statements are entirely truthful and accurate, Dr. Kupers can only speak to the experience of those particular prisoners interviewed as they were not randomly selected and do not represent the population.

40. Dr. Kupers' study was not designed as an institutional study or study of populations and the evidence he provides for his conclusions consists of a collection of observations that do not tell us much of anything about the two inmate populations. This is to say nothing of the fact that Dr. Kupers did not control for other variables that might explain his observations and no conclusions about EMCF being the cause of the prisoners' conditions can be made. One has to consider the condition the prisoners were in when they got there and whether or not exceptional circumstances were present during the experts' visit. For instance, while the

individual is still mentally ill, perhaps he is in better shape than when he got there.

41. Dr. Kupers made observations and declared them typical and caused by EMCF, but he did not use appropriate statistical techniques when gathering information from and drawing conclusions about the prison population at EMCF. Dr. Kupers' methods deny anyone else the chance to independently attempt to replicate his results. There were no measurable results. This is a misuse of anecdotal evidence to validate conclusions.

42. Finally, there has to be some basis for comparison. "There are many reasons not to base beliefs solely on personal experience. Research, by contrast, asks the critical question: "Compared to what?" (Research Methods in Psychology, page 25). "Basing conclusions on systematic data collection has the simple but tremendous advantage of providing a comparison group" (Research Methods in Psychology, page 27). Dr. Kupers' methodology includes no comparison group.

43. Dr. Kupers did not use a formal or scientific procedure at all when making inferences about EMCF and its populations. Instead, he claims to have enough previous experience to allow him to make these conclusions without the assistance of science. He has used no procedure to support his claims about the populations that can be tested. The mechanisms he used to draw conclusions about the populations at EMCF exist only in his head. His procedure could not be peer reviewed.

44. Dr. Kupers employed no reliable principles or methods when making conclusions about the populations. There are reliable principles and methods for supporting the types of conclusions he makes but these are not even mentioned in Dr. Kupers' report much less utilized. There is no way to know the potential rate of error but it is reasonable to suspect it is quite high.

Dr. Kupers took anecdotal evidence and concluded that these anecdotes are applicable to the whole population. There are no standards or controls in Dr. Kupers' procedure. In fact, he used no formal procedure at all.

45. Dr. Kupers' technique is not accepted to any degree in the scientific community. The type of evidence he provides is called anecdotal and is used in the scientific community to mean the opposite of scientific evidence. There are only two ways to demonstrate sufficient scientific evidence exists to support claims about populations. One is to study the entire population. The other is to take a representative sample and apply statistical inference to make conclusions about the population. There is no other accepted technique. Dr. Kupers did not study every individual in the populations about which he made conclusions. Nor did he take a representative sample and use statistical inference. Therefore, the conclusions about the populations are not based on sufficient facts or data. Dr. Kupers misused anecdotal evidence to validate conclusions that can only be validated with scientific evidence.

And further affiant sayeth not.

EMLEE W. NICHOLSON, Ph.D.

SWORN TO AND SUBSCRIBED BEFORE ME, this the 15th day of December, 2014.

NOTARY PUBLIC

My Commission Expires:

STATE OF MISSISSIPPI NOTARY PUBLIC ID # 25790 MARY LYNNE AGNEW UNDERWOOD Commission Expires July 31, 2017 COUNTY

Emlee W. Nicholson

Curriculum Vitae

email: emlee.nicholson@millsaps.edu

Education

University of Mississippi, University, MS

Doctor of Philosophy in Mathematics, May 2007

University of Mississippi, University, MS

Master of Science in Mathematics, May 2004

Georgia State University, Atlanta, GA

Bachelor of Business Administration in Actuarial Science, May 2000

Cum Laude

Mississippi State University, Starkville, MS

June 1995 - May 1998

Professional Experience

Assistant Professor, Millsaps College, Department of Mathematics, August 2010-present

Assistant Professor, Winthrop University, Department of Mathematics, August 2007 - July 2009

NSF North Mississippi Grades K-8 Fellow and Administrator, University of Mississippi, June 2006 - May 2007

NSF NMGK-8 Fellow and Elementary Team Leader, University of Mississippi,

June 2005-June 2006

NSF NMGK-8 Fellow, University of Mississippi, June 2004-June 2006

Graduate Instructor, University of Mississippi, June 2003- May 2006

Graduate Teaching Assistant, University of Mississippi, August 2002-May 2003

Actuarial Associate, Acuff & Associates, Nashville, TN, July 2001-July 2002

Actuarial Associate, Towers Perrin, Atlanta, GA, June 2000-June 2001

Publications

Nicholson, E.W., & Wei, B. Degree Sum Condition for k-ordered Hamiltonian Connected Graphs. *Graphs and Combinatorics,* 2014, 10.1007/s00373-013-1393-x

Nicholson, E.W., & Wei, B. (2014) Long paths containing k-ordered vertices in graphs. *Ars Combinatoria,* 114, 437-448.

Nicholson, E.W., & Strickland D.M. (2009) Making connections to mathematics beyond high school: An exploration of graph colorings. *The MathMate, 32(3).*

Nicholson, E.W., & Wei, B. (2008). Long cycles containing k-ordered vertices in graphs. *Discrete Mathematics,* 308(9), 1563-1570.

Nicholson, E.W. (2008). Making connections to mathematics beyond high school: An exploration of graph connectivity. *The MathMate, 31(2).*

Presentations

E.W. Nicholson and B. Wei. *Degree conditions for weakly geodesic pancyclic graphs and their exceptions.* MAA/AMS Joint Mathematics Meeting, Baltimore, MD, January, 2014.

E.W. Nicholson and B. Wei. *Degree sum conditions for k-ordered hamiltonian connected graphs.* Invited talk at the American Mathematical Society Southeastern Sectional Meeting, Oxford, MS, March, 2013.

E.W. Nicholson and B. Wei. *Degree sum conditions for k-ordered hamiltonian connected graphs.* Invited talk at the University of Mississippi as one of their series of Combinatorics Seminars, Oxford, MS, April, 2012.

E.W. Nicholson and B. Wei. *Degree sum conditions for k-ordered hamiltonian connected graphs.* Session conducted at the Louisiana/Mississippi Sectional MAA meeting, Oxford, MS, February, 2011.

E.W. Nicholson. *Bringing Higher Mathematics into the High School Classroom: An Introduction to Graph Connectivity.* Session conducted at the Annual Meeting of the South Carolina Council of Teachers of Mathematics, Charleston, SC. October 2008.

B. Wei and E.W. Nicholson. *Long Paths containing k-ordered vertices in Graphs.* Session conducted at the SIAM conference on Discrete Mathematics, Victoria, Canada. June 2006.

E.W. Nicholson and B. Wei. *Long Paths containing k-ordered vertices in Graphs.* Session conducted at the Combinatorics Seminar at The University of Mississippi, University, MS. November 2005.

B. Wei and E.W. Nicholson. *Long Cycles containing k-ordered vertices in Graphs.* Presentation given at the MIGHTY XLI conference at Middle Tennessee State University. Murfreesboro, TN. September 2005.

Awards

W. Charles Sallis Award for distinguished service to Millsaps College, 2014

Graduate Student Achievement Award: M.S. in Mathematics, University of Mississippi, 2004

Eli A. Zubay Award for Excellence in Actuarial Science, Georgia State University, 1999

Courses Taught

Math 1130 - Elementary Functions

Math 1150 - Elementary Statistics

Math 1220 - Calculus I

Math 2230 - Calculus II

Math 2310 - Introduction to Advanced Math

Math 3620 - Number Theory

Math 3650 - Linear Algebra

Math 4800 - Graph Theory

Professional Memberships

Mathematical Association of America

Mathematical Association of America Louisiana/Mississippi Section

LA/MS Sectional Project NEXT Fellowship

IN THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF MISSISSIPPI NORTHERN DIVISION

JERMAINE DOCKERY, et al **PLAINTIFFS**

v. **Civil Action No. 3:13cv326-WHB-JCG**

RICHARD D. MCCARTY[1], et al **DEFENDANTS**

AFFIDAVIT OF EMLEE WOODARD NICHOLSON

STATE OF MISSISSIPPI
COUNTY OF HINDS

PERSONALLY APPEARED BEFORE ME, the undersigned authority in and for the county and state aforesaid, EMLEE WOODARD NICHOLSON, who having been duly sworn stated on her oath as follows:

1. My name is Emlee Woodard Nicholson and I am an adult resident citizen of the state of Mississippi.

2. I am over the age of 21 years of age and competent to testify with regard to the matters stated herein. I have personal knowledge of the facts and information contained in this affidavit.

3. I earned a BBA in Actuarial Science from Georgia State University where I received the award for excellence in my field. I worked as an actuary for two years before earning my Masters and PhD in mathematics from the University of Mississippi where I received the award for excellence in my field.

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[1] Pursuant to F.R.C.P. 25(d), Richard D. McCarty, Interim Commissioner, is substituted for Christopher Epps, who resigned as Commissioner on November 5, 2014.

4. I am currently an Assistant Professor of Mathematics at Millsaps College in Jackson, Mississippi. Over the past 12 years, I have taught statistics many times both at the University of Mississippi and at Millsaps College. My course includes sampling techniques, research bias and how to avoid it, and statistical study design among many other topics in statistics. My current *Curriculum Vitae* is attached to my affidavit.

INTRODUCTION

5. Family Nurse Practitioner (FNP) Madeleine LaMarre was at the East Mississippi Correctional Facility for three days. She toured portions of the facility, spoke with selected inmates and reviewed medical records of certain inmates. Based on her observations during these procedures, she made broader conclusions about the overall conditions at the facility and well-being of the inmates.

6. When selecting medical records to review and inmates to interview, FNP LaMarre did not employ appropriate sampling techniques that would allow for inferences to be made about any broader population. Furthermore, she shared files with other experts ensuring that their findings would not be independent and that bias would appear in all samples.

7. The methodology employed by FNP LaMarre precludes her from making inferences of any sort about the population from which her samples were taken including but not limited to: EMCF as a facility, the staffing and operation of the medical department or the population of inmates at EMCF.

8. Based on the samples of medical records, inmate interviews, and cell tour, no valid conclusions can be drawn about any persons other than the specific cases chosen for study.

9. FNP LaMarre's conclusions should not be projected from the subgroup of inmates to the population of inmates or to the operation of the facility because she did not use mathematics and statistics to standardize the generalization process. Because FNP LaMarre did not use this process, there is no way to confirm the trustworthiness of her generalizations. Scientific techniques have been well established for collecting evidence in support of scientific claims to ensure objectivity. FNP LaMarre's conclusions were not built upon scientific evidence and cannot be tested by others. Instead, her conclusions are based on her subjective experience and whims.

10. FNP LaMarre used biased sampling when she selected the inmates to speak with and the inmates' charts to review. She did not take care to ensure that the inmates in the sample were representative of the inmate population from which the sample was drawn so she can make only biased conclusions about the inmate populations.

11. Additionally, FNP LaMarre did not use a scientifically recognized method called statistical inference to analyze the information she obtained from the inmate sample. Statistical inference is the process of making decisions about a population based on information contained in a sample from that population. FNP LaMarre's report contains no evidence that she applied statistical inference. Instead, FNP LaMarre's report uses biased samples and anecdotal evidence, but such information is not scientific evidence and should not be used to validate conclusions for the inmate populations.

STATISTICAL INFERENCE AND HYPOTHESIS TESTING OF A PARAMETER OF A POPULATION

12. Statistical inference is the process of using data from a sample of a population to make conclusions (called inferences) about the same population.

13. Statistical inference requires that certain procedures be followed.

14. Statistical inference in the form of hypothesis testing is used when a scientist seeks evidence for suspected truths about a parameter of a population. One must state hypotheses, collect representative samples, test the information gleaned from those samples, and make appropriate conclusions in context.

15. A parameter is a numerical attribute of the population that describes some aspect of the population. Statistical inference is applicable when the parameter is unknown. A hypothesis test based on sample data should be conducted to test a claim about a parameter of a population.

16. A hypothesis test can be run to seek evidence for a claim about a single parameter of a population or a hypothesis test can be run to compare the same parameter for two or more different populations.

17. A hypothesis test is conducted as follows: First, a researcher must state a measurable claim about a parameter of a population. Second, determine two competing hypotheses for the measurable claim: (1) the null hypothesis and (2) the alternate hypothesis. These hypotheses are the two possibilities. Third, gather data from a representative sample. Fourth, compute the sample statistic that estimates the parameter of the population in the claim. Fifth, determine how probable that statistic would be if the null hypothesis were true. If the observed statistic is determined to be highly unlikely if the null hypothesis were true, that is strong evidence that the null hypothesis is, in fact, not true. If the observed statistic is determined not to be highly unlikely, then the results are not statistically significant and the test was inconclusive.

RANDOM SAMPLING

18. Statistical inference will produce valid inferences only when the sample of the population is representative of the population.

19. Representative sampling is the foundation of inferential statistics. Random sampling is the most reliable way to collect a representative sample because the random sampling process ensures that every member of the population has an equal chance of being in the sample. A formal random sampling technique must be used.

20. The best and most common way to approach randomness is with technology. There are programs (Microsoft Excel, Minitab, etc.) capable of quickly selecting a random sample from a list of the population or from a list of numbers where each member of the population is represented by a number. This can be done in a few seconds. Generally speaking, prison populations are well suited for random sampling because the inmates are all contained in one location and contacting the members of the sample would not be cost prohibitive. The inmates in the population to be sampled can be given a number and the number is then entered into a program which randomly selects the inmates who are to be in the sample.

21. FNP LaMarre did not use any formal random sampling technique to select the inmates she interviewed or to select the medical records she reviewed.

EXAMPLE OF STATISTICAL INFERENCE

22. Assume we wanted to know whether inmates on average spend less than 5 hours in the common areas of their cell blocks in a given week. The parameter for the claim is "average amount of time in a given week spent by the inmates in the common areas of their cell

block." That parameter is unknown, it is a fixed value that can be expressed in a measurement of time and it represents a characteristic of the inmate population.

23. The null hypothesis would be "the average amount of time spent by the inmates in a given week in the common areas of their cell blocks is greater than or equal to 5 hours." The alternate hypothesis would be that "the average amount of time spent by the inmates in a given week in the common areas of their cell blocks is less than 5 hours." All inmates in the cell blocks are given a number and a program is used to randomly select 30 inmates from those in the cell blocks. Those 30 inmates are observed to determine the length of time each of them spends in the common areas in a given week. The average length of time the inmates in the sample spend in the common areas that week is computed from this data. The result for the random sample is an estimate for the average amount of time in a given week all inmates in the population spent in the common areas of their cell block and can be used to test the claim.

BIASED SAMPLING

24. If a sample is collected in any way that causes meaningful differences between the sample and the population, then the sample is biased. A biased sample can produce misleading results so no inferences can be made about a population from a biased sample. Sampling in a way that introduces bias eliminates the possibility of making any meaningful inference about the population from which the sample was drawn.

25. Haphazardly selecting a sample on one's own will likely produce a biased sample. FNP LaMarre's report has findings that are based on this type of biased sampling.

26. Allowing individuals to "volunteer" to be in the sample or relying on answers that may not be truthful will likely produce a biased sample. FNP LaMarre relied on this type of

biased sampling for some of her findings.

27. Selecting individuals to be in the sample because they are examples of a claim's truth is the most egregious form of sampling bias and is unacceptable in a scientific study. Some of FNP LaMarre's findings are based on this type of biased sampling.

FNP LAMARRE'S METHODOLOGY AND OPINIONS

28. Most of FNP LaMarre's report is dedicated to specific case analysis about particular inmates. However, she does generalize her findings for the specific inmates and project those findings to various inmate populations and makes conclusions about EMCF as an institution. Unfortunately, she makes no mention in her methodology as to how her files were selected for review or how she selected inmates with whom to speak. The report shows that her list of 20 inmates contains at least 5 inmates that appear on the lists of other experts. [2] This sharing of inmates strongly suggests that FNP LaMarre did not randomly select the 20 inmates and therefore they do not represent the population. Regardless, Ms. LaMarre did not use statistical inference, thus her statements about the general population of inmates, patients, or EMCF as a whole are invalid.

29. FNP LaMarre's report is divided into sections. In most of these sections, the heading is a claim that applies to some population of inmates, typically all inmates with the condition referred to in the heading. Under each heading, FNP LaMarre provides examples of instances of her claim. These examples are called anecdotal evidence and should not be mistaken for scientific evidence of a claim about a population. For instance, under the heading

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[2] Dr. Terry Kupers Report, Name Key, Exhibit C; Dr. Marc Stern Report, List of Patient Names, Attachment 2; Dr. Bart Abplanalp Report, Name Key, Exhibit B; Ms. LaMarre Report, Appendix A, Patient ID Numbers.

"Inadequate Care of Patients with HIV Infection", FNP Lamarre describes the experience of two particular patients she was able to find among all of the patients. She provides no random sampling or statistical inference that would be required to support a claim about "patients with HIV infection". In fact, it should be noted that in one of the two illustrative cases of "inadequate care", FNP LaMarre states that "this patient is receiving routine monitoring for his HIV infection and his disease is well-controlled." (LaMarre at 20-23).

30. FNP LaMarre states: "Patients also do not receive timely care for treatment of skin and wound infections." She cites a single patient as evidence of support. (LaMarre at 14). If this claim is in fact true of this one patient, it would be appropriate to state that "a patient did not receive timely care for treatment of skin and wound infections." This anecdote cannot be applied to the population of "patients".

31. FNP LaMarre states: "Record review also demonstrated that EMCF patients do not have timely access to care for their serious medical conditions." (LaMarre at 9). FNP LaMarre never randomly sampled records of EMCF patients and determined the prevalence of untimely access to care in the sample much less tested her findings for significance so that the results could be inferred to the population. This claim about "EMCF patients" goes far beyond what her data and methodologies can support.

32. FNP LaMarre claims: "providers do not review and address laboratory reports …", "when patients transfer to EMCF, providers do not adequately review previous medical treatment…", and "EMCF providers do not review and follow up specialist reports in a timely manner, if at all…" (LaMarre at 38). For each of these claims, FNP LaMarre provides a single instance as supporting evidence. She did not use random sampling or statistical inference to

support her claim. Therefore, her claims about the population of "EMCF providers" are not scientifically supported.

33. FNP LaMarre contends that "[t]he problems I found are common to the system as a whole." (LaMarre at 8). FNP LaMarre's report provides no support for projecting the problems she found for specific inmates onto the entire system. She did not conduct a study of the system as a whole. Her samples are biased, her evidence anecdotal. She conducted no scientific analysis of the system.

34. FNP LaMarre also claims that "[a]t EMCF patients do not have timely access to specialty services and follow-up of specialist recommendations resulting in a risk or actual harm to the patient." Her sole support for this claim is her review of 18 inmate medical records: "I found lack of timely access to be the case in eleven of eighteen records I performed for this review." (LaMarre at 25). FNP LaMarre's sample of 18 medical records is biased which makes the 11 examples anecdotal and invalid to support a claim about all "EMCF patients". Because she does not show that the sample was selected at random and she did not perform statistical inference, her conclusions cannot be generalized to the population of "EMCF patients."

35. FNP LaMarre did not use a formal or scientific procedure at all when making inferences about EMCF and its populations. Instead, she makes these conclusions without the assistance of science. She has used no procedure to support her claims about the populations that can be tested. The mechanisms she used to draw conclusions about the populations at EMCF exist only in her head. Her procedure could not be peer reviewed.

36. FNP LaMarre employed no reliable principles or methods when making conclusions about the populations. There are reliable principles and methods for supporting the types of

conclusions she makes but these are not even mentioned in FNP LaMarre's report much less utilized. There is no way to know the potential rate of error but it is reasonable to suspect it is quite high. FNP LaMarre took anecdotal evidence and concluded these anecdotes are applicable to the whole population. There are no standards or controls in FNP LaMarre's procedure. In fact, she used no formal procedure at all.

37. FNP LaMarre's technique is not accepted to any degree in the scientific community. The type of evidence she provides is called anecdotal and is used in the scientific community to mean the opposite of scientific evidence. There are only two ways to demonstrate sufficient scientific evidence exists to support claims about populations. One is to study the entire population. The other is to take a representative sample and apply statistical inference to make conclusions about the population. There is no other accepted technique. FNP LaMarre did not study every individual in the populations about which she made conclusions. Nor did she take a representative sample and use statistical inference. Therefore, the conclusions about the populations are not based on sufficient facts or data. FNP LaMarre misused anecdotal evidence to validate conclusions that can only be validated with scientific evidence.

And further affiant sayeth not.

Emlee W. Nicholson

EMLEE W. NICHOLSON, Ph.D.

SWORN TO AND SUBSCRIBED BEFORE ME, this the 15th day of December, 2014.

NOTARY PUBLIC

My Commission Expires:

STATE OF MISSISSIPPI
NOTARY PUBLIC
ID # 25790
MARY LYNNE AGNEW UNDERWOOD
Commission Expires
July 31, 2017
RANKIN COUNTY

Emlee W. Nicholson

Curriculum Vitae

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Presentations

E.W. Nicholson and B. Wei. *Degree conditions for weakly geodesic pancyclic graphs and their exceptions.* MAA/AMS Joint Mathematics Meeting, Baltimore, MD, January, 2014.

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Math 2230 - Calculus II

Math 2310 - Introduction to Advanced Math

Math 3620 - Number Theory

Math 3650 - Linear Algebra

Math 4800 - Graph Theory

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LA/MS Sectional Project NEXT Fellowship

IN THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF MISSISSIPPI NORTHERN DIVISION

JERMAINE DOCKERY, et al **PLAINTIFFS**

v. **Civil Action No. 3:13cv326-WHB-JCG**

RICHARD D. MCCARTY[1], et al **DEFENDANTS**

AFFIDAVIT OF EMLEE WOODARD NICHOLSON

STATE OF MISSISSIPPI
COUNTY OF HINDS

PERSONALLY APPEARED BEFORE ME, the undersigned authority in and for the county and state aforesaid, EMLEE WOODARD NICHOLSON, who having been duly sworn stated on her oath as follows:

1. My name is Emlee Woodard Nicholson and I am an adult resident citizen of the state of Mississippi.

2. I am over the age of 21 years of age and competent to testify with regard to the matters stated herein. I have personal knowledge of the facts and information contained in this affidavit.

3. I earned a BBA in Actuarial Science from Georgia State University where I received the award for excellence in my field. I worked as an actuary for two years before earning my Masters and PhD in mathematics from the University of Mississippi where I received the award for excellence in my field.

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[1] Pursuant to F.R.C.P. 25(d), Richard D. McCarty, Interim Commissioner, is substituted for Christopher Epps, who resigned as Commissioner on November 5, 2014.

4. I am currently an Assistant Professor of Mathematics at Millsaps College in Jackson, Mississippi. Over the past 12 years, I have taught statistics many times both at the University of Mississippi and at Millsaps College. My course includes sampling techniques, research bias and how to avoid it, and statistical study design among many other topics in statistics. My current *Curriculum Vitae* is attached to my affidavit.

INTRODUCTION

5. Bart Abplanalp, Ph.D. was at the East Mississippi Correctional Facility for two days where he reviewed medical records of certain inmates and thereafter he reviewed medical records for other inmates. Based on his observations from his review of these medical records, he made broader conclusions about the overall well-being of the inmates.

6. When selecting medical records to review, Dr. Abplanalp did not employ appropriate sampling techniques that would allow for inferences to be made about any broader population. Furthermore, he shared files with other experts ensuring that their findings would not be independent and that bias would appear in all samples.

7. The methodology employed by Dr. Abplanalp precludes him from making inferences of any sort about the population from which his samples were taken including but not limited to: EMCF as a facility, the population of inmates at EMCF, the population of inmates in isolation at EMCF, the population of inmates receiving mental health services at EMCF, or the population of inmates housed in Units 5 and 6.

8. Based on the samples of medical records no valid conclusions can be drawn about any persons other than the specific cases chosen for study.

9. Dr. Abplanalp's conclusions should not be projected from the sample of inmates

to a population of inmates because he did not use mathematics and statistics to standardize the generalization process. Because Dr. Abplanalp did not use this process, there is no way to confirm the trustworthiness of his generalizations. Scientific techniques have been well established for collecting evidence in support of scientific claims to ensure objectivity. Dr. Abplanalp's conclusions were not built upon scientific evidence and cannot be tested by others. Instead, his conclusions are based on his subjective experience and whims.

10. Dr. Abplanalp used biased sampling when he selected the inmates in the subgroup, he did not take care to ensure that the inmates in the sample were representative of the inmate populations so he can make only biased conclusions about the inmate populations.

11. Additionally, Dr. Abplanalp did not use a scientifically recognized method called statistical inference to analyze the information he obtained from the inmate subgroup. Statistical inference is the process of making decisions about a population based on information contained in a sample from that population. Dr. Abplanalp's report contains no evidence that he applied statistical inference. Instead, Dr. Abplanalp's report uses biased samples and anecdotal evidence, but such information is not scientific evidence and should not be used to validate conclusions for the inmate populations.

STATISTICAL INFERENCE AND HYPOTHESIS TESTING OF A PARAMETER OF A POPULATION

12. Statistical inference is the process of using data from a sample of a population to make conclusions (called inferences) about the same population.

13. Statistical inference requires that certain procedures be followed.

14. Statistical inference in the form of hypothesis testing is used when a scientist seeks evidence for suspected truths about a parameter of a population. One must state

hypotheses, collect representative samples, test the information gleaned from those samples, and make appropriate conclusions in context.

15. A parameter is a numerical attribute of the population that describes some aspect of the population. Statistical inference is applicable when the parameter is unknown. A hypothesis test based on sample data should be conducted to test a claim about a parameter of a population.

16. A hypothesis test can be run to seek evidence for a claim about a single parameter of a population or a hypothesis test can be run to compare the same parameter for two or more different populations.

17. A hypothesis test is conducted as follows: First, a researcher must state a measurable claim about a parameter of a population. Second, determine two competing hypotheses for the measurable claim: (1) the null hypothesis and (2) the alternate hypothesis. These hypotheses are the two possibilities. Third, gather data from a representative sample. Fourth, compute the sample statistic that estimates the parameter of the population in the claim. Fifth, determine how probable that statistic would be if the null hypothesis were true. If the observed statistic is determined to be highly unlikely if the null hypothesis were true, that is strong evidence that the null hypothesis is, in fact, not true. If the observed statistic is determined not to be highly unlikely, then the results are not statistically significant and the test was inconclusive.

RANDOM SAMPLING

18. Statistical inference will produce valid inferences only when the sample of the population is representative of the population.

19. Representative sampling is the foundation of inferential statistics. Random sampling is the most reliable way to collect a representative sample because the random sampling process ensures that every member of the population has an equal chance of being in the sample. A formal random sampling technique must be used.

20. The best and most common way to approach randomness is with technology. There are programs (Microsoft Excel, Minitab, etc.) capable of quickly selecting a random sample from a list of the population or from a list of numbers where each member of the population is represented by a number. This can be done in a few seconds. Generally speaking, prison populations are well suited for random sampling because the inmates are all contained in one location and contacting the members of the sample would not be cost prohibitive. The inmates in the population to be sampled can be given a number and the number is then entered into a program which randomly selects the inmates who are to be in the sample.

21. Dr. Abplanalp did not use any formal random sampling technique to select the medical records he reviewed.

EXAMPLE OF STATISTICAL INFERENCE

22. Assume we wanted to know whether inmates on average spend less than 5 hours in the common areas of their cell blocks in a given week. The parameter for the claim is "average amount of time in a given week spent by the inmates in the common areas of their cell block." That parameter is unknown, it is a fixed value that can be expressed in a measurement of time and it represents a characteristic of the inmate population.

23. The null hypothesis would be "the average amount of time spent by the inmates in a given week in the common areas of their cell blocks is greater than or equal to 5 hours." The

alternate hypothesis would be that "the average amount of time spent by the inmates in a given week in the common areas of their cell blocks is less than 5 hours." All inmates in the cell blocks are given a number and a program is used to randomly select 30 inmates from those in the cell blocks. Those 30 inmates are monitored to determine the length of time each of them spends in the common areas in a given week. The average length of time the inmates in the sample spend in the common areas that week is computed from this data. The result for the random sample is an estimate for the average amount of time in a given week all inmates in the population spent in the common areas of their cell block and can be used to test the claim.

BIASED SAMPLING

24. If a sample is collected in any way that causes meaningful differences between the sample and the population, then the sample is biased. A biased sample can produce misleading results so no inferences can be made about a population from a biased sample. Sampling in a way that introduces bias eliminates the possibility of making any meaningful inference about the population from which the sample was drawn.

25. Haphazardly selecting a sample on one's own will likely produce a biased sample. Dr. Abplanalp's report has findings that are based on this type of biased sampling.

26. Selecting individuals to be in the sample because they are examples of a claim's truth is the most egregious form of sampling bias and is unacceptable in a scientific study. Some of Dr. Abplanalp's findings are based on this type of biased sampling.

DR. ABPLANALP'S METHODOLOGY AND OPINIONS

27. In the methodology section of his report, Dr Abplanalp explains that "a number" of charts he reviewed were suggested to him by "Dr. Kupers and by Plaintiffs' counsel."

(Abplanalp at 3). His report does not say how many "a number" is, but it does show that 22 of the 28 inmates listed in his appendix were also selected and relied upon by at least one of the other medical experts.[2] Dr. Abplanalp also claims to have selected other charts "randomly from lists of admissions to the Observation Unit as well as patients currently residing in segregation and other living units." (Abplanalp at 3). However, this selection was not random in the statistical sense because the report does not show that random sampling, as I explain above, was used to select the inmate medical records for review.

28. By including charts that were recommended by the other experts and Plaintiffs' counsel, the damage has been done to Dr. Abplanalp's sample. Haphazardly selecting a handful of inmate medical records to add to the handpicked ones does not remove the bias. Suppose, for illustrative purposes, that 11 of the 22 shared files were given to Dr. Abplanalp by other experts and the other 11 were actually selected by Dr. Abplanalp and shared with other experts (thereby biasing their samples). In this case, Dr. Abplanalp's sample would contain 11 prisoners who had a 100% chance of being selected, and every other prisoner at EMCF had a 1.4% chance of being in his sample (assuming a population size of 1200 inmates). In a representative sample, every member of the population should have an equal chance of being selected.

29. From this biased sample, Dr. Abplanalp makes six opinions or claims about the entire prison population or EMCF in general. None of these claims are valid for the whole population.

30. His Opinion I states that "prisoners at EMCF lack adequate access to treatment

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[2]Dr. Terry Kupers Report, Name Key, Exhibit C; Dr. Marc Stern Report, List of Patient Names, Attachment 2; Dr. Bart Abplanalp Report, Name Key, Exhibit B; Ms. LaMarre Report, Appendix A, Patient ID Numbers.

for serious mental health needs." (Abplanalp at 3). Opinion I is misleading as he never sampled "prisoners at EMCF" and assessed the access to treatment for serious mental health needs for the individuals in the sample. Furthermore, Dr. Abplanalp has not tested to see if his evidence is significant and applicable to the population. Therefore, this opinion is not supported by scientific evidence.

31. Under Opinion I, Dr. Abplanalp makes many other claims about populations he has not sampled or scientifically studied. He claims "mental health staff deny patients access to care." To support this, Dr. Abplanalp provides anecdotal evidence from three patients. He has no scientific support for a claim about "mental health staff". (Abplanalp at 4-5). Dr. Abplanalp claims: "the lack of confidentiality creates a dangerous barrier to care" citing the noise level in the units as his primary evidence. (Abplanalp at 6-7). The noise level at the moment of Dr. Abplanalp's visit, is not evidence that it is typically noisy as is suggested by this claim. To establish a pattern or typicality, one needs more than one data point.

32. Dr. Aplanalp's Opinion II states that "[t]he mental health care system at EMCF does not provide levels of care that meet inmates' mental health care needs, and it fails to adequately care for patients in psychiatric crisis." (Abplanalp at 10). He has not conducted a scientific study of patients in psychiatric crisis. Dr. Abplanalp relies on his biased sample of inmate medical records and intuition to support this opinion. ("My review of mental health charts led me to the conclusion that prisoners at EMCF do not have meaningful access to any of these levels [of a mental health system] of care." (Abplanalp at 11)).

33. Opinion III states that "EMCF fails to respond to psychiatric emergencies and provide adequate crisis intervention", but this opinion is also based on his biased sample of

medical records. (Abplanalp at 12-13). Dr. Abplanalp did not study the rate at which EMCF responds to and provides intervention for psychiatric emergencies. Instead he found one patient whom he concluded was failed by the system. This type of evidence (an example or collection of examples) is called anecdotal and should not be mistaken for scientific support of a claim about the entire mental health staff at EMCF.

34. Opinion IV states that "[t]he Mental Health System at EMCF fails to provide even minimally adequate quality of care" but again he relies on the biased sample of inmate medical records to support this opinion. (Abplanalp at 13-16). From a review of 28 records, a number of which were handpicked because they were problematic, Dr. Abplanalp makes declarations about facets of care being significantly lacking or "practically non-existent" at EMCF. (Abplanalp at 13). The existence of a few files in which a facet of care is absent is not sufficient evidence of that facet of care being "practically non-existent" at the facility. He even makes an assertion about "the vast majority of mental health encounters for prisoners in segregation…" (Abplanalp at 16). To establish a claim about the majority of mental health encounters (much less the "vast" majority), Dr. Abplanalp needs a representative sample and statistical inference. He did not utilize proper scientific techniques to support this claim.

35. Opinion V states "[t]he mental health system at EMCF does not adequately assess risk of self-harm or harm to others and places inmates at grave risk." (Abplanalp at 16-19). Dr. Abplanalp has not even defined what adequate risk assessment would be or conducted a study of the risk assessment at EMCF. He found some examples of charts, but does not say how many, that he deemed to contain inadequate risk assessment. Dr. Abplanalp's claim is imprecise and his evidence is anecdotal.

36. Opinion VI states "[m]ental health records are entirely unreliable and incomplete." (Abplanalp at 20-21). Dr. Abplanalp provides no evidence to support a claim about all mental health records. He reviewed a biased sample and projected his opinion about that sample to the population of mental health records. That can only be done with statistical inference. This is exactly as meaningful as finding 28 mental health records that are reliable and complete and declaring the mental health records at EMCF to be complete and entirely reliable.

37. It is invalid to make claims about "inmates" or "prisoners" or "EMCF" which imposes generality where it does not belong. Dr. Abplanalp's sample of patient records was not drawn in a way to represent the population. To support a claim about "inmates", one should take a simple random sample of ALL "inmates" and include no handpicked files that other people suggested. The charts in Dr. Abplanalp's sample should have led to no conclusions about the general population of prisoners or the facility as a whole as those individuals in the sample do not represent the population at EMCF.

38. In Dr. Abplanalp's conclusion to his report he claims that two inmates he identifies as Patient 12 and Patient 13 are representative and are "not at all unusual cases at EMCF." (Abplanalp at 23). These two inmates are examples of anecdotal evidence. Dr. Abplanalp's conclusion is baseless as anecdotal evidence is not scientific. In Dr. Abplanalp's opinion, Patients 12 and 13 may not have been unusual among those he reviewed, but the charts he reviewed were not randomly selected to represent the population of "cases at EMCF."

39. Dr. Abplanalp did not use a formal or scientific procedure at all when making inferences about EMCF and its populations. Instead, he makes these conclusions without the assistance of science. He has used no procedure to support his claims about the populations that

can be tested. The mechanisms he used to draw conclusions about the populations at EMCF exist only in his head. His procedure could not be peer reviewed.

40. Dr. Abplanalp employed no reliable principles or methods when making conclusions about the populations. There are reliable principles and methods for supporting the types of conclusions he makes but these are not even mentioned in Dr. Abplanalp's report much less utilized. There is no way to know the potential rate of error but it is reasonable to suspect it is quite high. Dr. Abplanalp took anecdotal evidence and concluded these anecdotes are applicable to the whole population. There are no standards or controls in Dr. Abplanalp's procedure. In fact, he used no formal procedure at all.

41. Dr. Abplanalp's technique is not accepted to any degree in the scientific community. The type of evidence he provides is called anecdotal and is used in the scientific community to mean the opposite of scientific evidence. There are only two ways to demonstrate sufficient scientific evidence exists to support claims about populations. One is to study the entire population. The other is to take a representative sample and apply statistical inference to make conclusions about the population. There is no other accepted technique. Dr. Abplanalp did not study every individual in the populations about which he made conclusions. Nor did he take a representative sample and use statistical inference. Therefore, the conclusions about the populations are not based on sufficient facts or data. Dr. Abplanalp misused anecdotal evidence to validate conclusions that can only be validated with scientific evidence.

And further affiant sayeth not.

EMLEE W. NICHOLSON, Ph.D.

SWORN TO AND SUBSCRIBED BEFORE ME, this the 15th day of December, 2014.

NOTARY PUBLIC

My Commission Expires:

STATE OF MISSISSIPPI
NOTARY PUBLIC
ID # 25790
MARY LYNNE AGNEW UNDERWOOD
Commission Expires
July 31, 2017
RANKIN COUNTY

Emlee W. Nicholson

Curriculum Vitae

email: emlee.nicholson@millsaps.edu

Education

University of Mississippi, University, MS

Doctor of Philosophy in Mathematics, May 2007

University of Mississippi, University, MS

Master of Science in Mathematics, May 2004

Georgia State University, Atlanta, GA

Bachelor of Business Administration in Actuarial Science, May 2000

Cum Laude

Mississippi State University, Starkville, MS

June 1995 - May 1998

Professional Experience

Assistant Professor, Millsaps College, Department of Mathematics, August 2010-present

Assistant Professor, Winthrop University, Department of Mathematics, August 2007 - July 2009

NSF North Mississippi Grades K-8 Fellow and Administrator, University of Mississippi, June 2006 - May 2007

NSF NMGK-8 Fellow and Elementary Team Leader, University of Mississippi,

June 2005-June 2006

NSF NMGK-8 Fellow, University of Mississippi, June 2004-June 2006

Graduate Instructor, University of Mississippi, June 2003- May 2006

Graduate Teaching Assistant, University of Mississippi, August 2002-May 2003

Actuarial Associate, Acuff & Associates, Nashville, TN, July 2001-July 2002

Actuarial Associate, Towers Perrin, Atlanta, GA, June 2000-June 2001

Publications

Nicholson, E.W., & Wei, B. Degree Sum Condition for k-ordered Hamiltonian Connected Graphs. *Graphs and Combinatorics,* 2014, 10.1007/s00373-013-1393-x

Nicholson, E.W., & Wei, B. (2014) Long paths containing k-ordered vertices in graphs. *Ars Combinatoria,* 114, 437-448.

Nicholson, E.W., & Strickland D.M. (2009) Making connections to mathematics beyond high school: An exploration of graph colorings. *The MathMate, 32(3).*

Nicholson, E.W., & Wei, B. (2008). Long cycles containing k-ordered vertices in graphs. *Discrete Mathematics,* 308(9), 1563-1570.

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